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FILE 'REGISTRY' ENTERED AT 10:26:30 ON 04 AUG 2008
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STRUCTURE FILE UPDATES: 2 AUG 2008 HIGHEST RN 1037774-47-2
DICTIONARY FILE UPDATES: 2 AUG 2008 HIGHEST RN 1037774-47-2

New CAS Information Use Policies, enter HELP USAGETERMS for details.

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<http://www.cas.org/support/stngen/stndoc/properties.html>

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(FILE 'HOME' ENTERED AT 09:42:29 ON 04 AUG 2008)

FILE 'HCAPLUS' ENTERED AT 09:42:41 ON 04 AUG 2008

L1 1 SEA ABB=ON PLU=ON US20050247670/PN
SEL RN

FILE 'REGISTRY' ENTERED AT 09:43:12 ON 04 AUG 2008

L2 6 SEA ABB=ON PLU=ON (138495-42-8/BI OR 378-22-3/BI OR
685-63-2/BI OR 692-50-2/BI OR 72804-49-0/BI OR 7631-86-9/
BI)
D SCA

L3 1 SEA ABB=ON PLU=ON PERFLUORO-2-PENTENE/CN

L4 1 SEA ABB=ON PLU=ON L2 AND L3
D SCA

FILE 'STNGUIDE' ENTERED AT 10:10:15 ON 04 AUG 2008

L5 0 SEA ABB=ON PLU=ON C5F8/CN

FILE 'REGISTRY' ENTERED AT 10:11:56 ON 04 AUG 2008

L6 0 SEA ABB=ON PLU=ON C5F8/CN
E 1,1,1,4,4,5,5,5-OCTAFLUORO-2-PENTENE/CN

L7 1 SEA ABB=ON PLU=ON "1,1,1,4,4,5,5,5-OCTAFLUORO-2-PENTENE
"/CN
E 1,1,1,2,4,4,5,5,5-NONAFLUORO-2-PENTENE/CN

L8 1 SEA ABB=ON PLU=ON "1,1,1,2,4,4,5,5,5-NONAFLUORO-2-PENTENE
NE"/CN
D SCA

E 1,1,1,3,4,4,5,5,5-NONAFLUORO-2-PENTENE/CN

L9 1 SEA ABB=ON PLU=ON "1,1,1,3,4,4,5,5,5-NONAFLUORO-2-PENTENE
NE"/CN

FILE 'HCAPLUS' ENTERED AT 10:19:23 ON 04 AUG 2008

L10 25 SEA ABB=ON PLU=ON L7
L11 34 SEA ABB=ON PLU=ON L8
L12 41 SEA ABB=ON PLU=ON L9
L13 QUE ABB=ON PLU=ON GAS## OR GASEOUS?
L14 QUE ABB=ON PLU=ON ETCH?
L15 20 SEA ABB=ON PLU=ON (L10 OR L11 OR L12) AND L13
L16 13 SEA ABB=ON PLU=ON (L10 OR L11 OR L12) AND L14
L17 11 SEA ABB=ON PLU=ON L15 AND L16
L18 11 SEA ABB=ON PLU=ON (L10 OR L11 OR L12) (L)L13
L19 8 SEA ABB=ON PLU=ON L17 AND L18
L20 3 SEA ABB=ON PLU=ON L18 NOT L19
L21 5 SEA ABB=ON PLU=ON L16 NOT (L19 OR L20)

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 10:26:32 ON 04 AUG 2008
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FILE COVERS 1907 - 4 Aug 2008 VOL 149 ISS 6
FILE LAST UPDATED: 3 Aug 2008 (20080803/ED)

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the second quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d 119 ibib abs hitstr hitind 1-8

L19 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:29893 HCAPLUS Full-text
DOCUMENT NUMBER: 144:119740
TITLE: Plasma chamber having plasma source coil and method for etching the wafer using the same
INVENTOR(S): Kim, Nam-Hun
PATENT ASSIGNEE(S): Adaptive Plasma Technology Corporation, S. Korea
SOURCE: PCT Int. Appl., 19 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

August 4, 2008

10/520,272

3

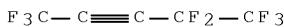
| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|--|---------------|------------------|-------------------------------|
| ----- | ----- | ----- | ----- | ----- |
| WO 2006004259 | A1 | 20060112 | WO 2005-KR860 | 200503 24 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | KR 2005095135 | A 20050929 | KR 2004-20321 200403 25 |
| EP 1733422 | A1 | 20061220 | EP 2005-789424 | 200503 24 |
| R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR | CN 1934683 | A 20070321 | CN 2005-80008980 | 200503 24 |
| JP 2007531264 | T | 20071101 | JP 2007-504887 | 200503 24 |
| TW 283026 | B | 20070621 | TW 2005-94109274 | 200503 25 |
| US 20070221622 | A1 | 20070927 | US 2006-593857 | 200609 22 |
| PRIORITY APPLN. INFO.: | | | KR 2004-20321 | A 200403 25 |
| | | | WO 2005-KR860 | W 200503 24 |

AB A plasma apparatus includes a chamber body, a plasma source coil, and an edge bushing. The chamber body includes a reaction space, which is limited by a sidewall, a lower exterior wall, and an upper dome, and forms plasma. The plasma source coil arranged on the dome includes several unit coils. The unit coils having a predetd. turning number "n" indicative of a pos. integer are extended from a center bushing having a predetd. radius at a center part, and are spirally arranged along a circumference of the center bushing, such that the plasma is formed in the reaction space. The edge bushing arranged between the dome of the chamber body and the plasma source coil, and is configured in the form of a cylindrical shape to overlap with an edge of the wafer arranged in the reaction space.

IT 378-22-3

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

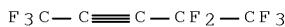
(etching gas; plasma etching apparatus)
 RN 378-22-3 HCPLUS
 CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)



IC ICM H01L021-3065
 CC 76-14 (Electric Phenomena)
 ST plasma etching app
 IT Etching
 Etching apparatus
 (plasma; plasma etching apparatus)
 IT 75-10-5 75-46-7, Trifluoromethane CHF₃ 75-73-0, Carbon fluoride (CF₄) 76-16-4 76-19-7 115-25-3, Carbon fluoride (C₄F₈) 378-22-3 593-53-3, Methyl fluoride 685-63-2
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (etching gas; plasma etching apparatus)
 REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 2 OF 8 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005:439007 HCPLUS Full-text
 DOCUMENT NUMBER: 143:123978
 TITLE: Adsorption behavior of various fluorocarbon gases on silicon wafer surface
 AUTHOR(S): Hidaka, Atsushi; Yamashita, Satoru; Ishii, Hidekazu; Kato, Takeyoshi; Tanahashi, Naoki; Kitano, Masafumi; Goto, Tetsuya; Teramoto, Akinobu; Shirai, Yasuyuki; Ohmi, Tadahiro
 CORPORATE SOURCE: Department of Electronic Engineering, Graduate School of Engineering, University of Tohoku, Miyagi, 980-8579, Japan
 SOURCE: Japanese Journal of Applied Physics, Part 1: Regular Papers, Brief Communications & Review Papers (2005), 44(4B), 2245-2251
 CODEN: JAPNDE
 PUBLISHER: Japan Society of Applied Physics
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB An anal. technique to clarifying the adsorption behavior of a fluorocarbon gas, which is one of the key steps in reactive ion etching, was established. The authors focus on the adsorption behavior of fluorocarbon gases to the silicon wafer surface to clarify the etching mechanism to realize etching to a high aspect ratio. Each fluorocarbon gas had surface selectivity for SiO₂, Si and the photoresist. Each fluorocarbon gas reacted differently at the silicon wafer surface. As a result, the etching mechanism could be clarified using this newly established anal. technique. Therefore, an etching mechanism will be able to be clarified by applying the newly established anal. technique to the fluorocarbon gases expected to be useful for etching of high aspect ratio and further high performance ultra large scale integrated circuit device must be realized.
 IT 378-22-3
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent) (adsorption behavior of various fluorocarbon gases on silicon wafer surface in reaction ion etching in

integrated circuit fabrication)
 RN 378-22-3 HCPLUS
 CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)



CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 66
 ST fluorocarbon adsorption silicon wafer surface reactive ion etching
 IT Adsorption
 Etching
 Integrated circuits
 Photoresists
 Semiconductor device fabrication
 (adsorption behavior of various fluorocarbon gases on silicon wafer surface in reaction ion etching in integrated circuit fabrication)
 IT Hydrocarbons, properties
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent) (fluoro; adsorption behavior of various fluorocarbon gases on silicon wafer surface in reaction ion etching in integrated circuit fabrication)
 IT 7440-21-3, Silicon, uses 7631-86-9, Silica, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (adsorption behavior of various fluorocarbon gases on silicon wafer surface in reaction ion etching in integrated circuit fabrication)
 IT 115-25-3 378-22-3 559-40-0
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent) (adsorption behavior of various fluorocarbon gases on silicon wafer surface in reaction ion etching in integrated circuit fabrication)
 REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 3 OF 8 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:60850 HCPLUS Full-text
 DOCUMENT NUMBER: 140:102052
 TITLE: Method of dry etching, dry etching gas, and process for producing perfluoro-2-pentyne
 INVENTOR(S): Yamada, Toshiro; Sugimoto, Tatsuya
 PATENT ASSIGNEE(S): Zeon Corporation, Japan
 SOURCE: PCT Int. Appl., 25 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|-------|
| ----- | ---- | ----- | ----- | ----- |
| ----- | ---- | ----- | ----- | ----- |
| WO 2004008515 | A1 | 20040122 | WO 2003-JP9023 | |

200307
16

W: CN, KR, US

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR

JP 2004055680 A 20040219 JP 2002-208604

200207
17

EP 1542268 A1 20050615 EP 2003-764209

200307
16

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK

CN 1669129 A 20050914 CN 2003-816972

200307
16

TW 288442 B 20071011 TW 2003-92119395

200307
16

US 20050247670 A1 20051110 US 2005-520272

200501
14

PRIORITY APPLN. INFO.: JP 2002-208604 A

200207
17

WO 2003-JP9023

W
200307
16

AB A method of dry etching, comprising exposing a resist film to radiation of 195 nm or less wavelength so as to form a resist pattern of 200 nm or less min. line width and subjecting the resist pattern to dry etching using a fluorinated compound of C4-C6 having at least one unsatd. bond as an etching gas. Perfluoro-2-pentyne, perfluoro-2-butyne, nonafluoro-2-pentene and perfluoro-2-pentene are preferably used as the fluorinated compound. Perfluoro-2-pentyne can be synthesized by reacting a 1,1,1-trihalo-2,2,2-trifluoroethane with pentafluoropropylene aldehyde into a 2-halo-1,1,1,4,4,5,5-octafluoro-2-pentene and eliminating a hydrogen halide from this 2-pentene.

IT 378-22-3P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(etching gas; dry etching of silicon oxide and resist films by)

RN 378-22-3 HCPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5-octafluoro- (CA INDEX NAME)

F₃C—C≡C—CF₂—CF₃

IC ICM H01L021-3065

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST dry plasma etching etchant gas
perfluoro pentyne; silicon oxide resist film etching

IT Resists
(dry etching of silicon oxide and resist films by)

IT Etching

(dry; dry etching of silicon oxide and resist films by)

IT Etching
(etchants; dry etching of silicon oxide and resist films by)

IT Etching
(plasma; dry etching of silicon oxide and resist films by)

IT 7631-86-9, Silica, processes
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(dry etching of silicon oxide and resist films by)

IT 685-63-2, Perfluoro-1,3-butadiene 692-50-2, Perfluoro-2-butyne
72804-49-0, Perfluoro-2-pentene
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(etching gas; dry etching of silicon oxide and resist films by)

IT 378-22-3P
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(etching gas; dry etching of silicon oxide and resist films by)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 4 OF 8 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2004:18200 HCAPLUS Full-text
DOCUMENT NUMBER: 140:86072
TITLE: Plasma etching process showing high etch rate and selectivity to masks in semiconductor device fabrication
INVENTOR(S): Fujimoto, Motomu
PATENT ASSIGNEE(S): Tokyo Electron, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|--------------|
| JP 2004006575 | A | 20040108 | JP 2002-228418 | 200208 06 |
| PRIORITY APPLN. INFO.: | | | JP 2002-228418 | 200208 06 |

AB In the process, ethant gases containing linear C5F8, preferably 1,1,1,4,4,5,5,5-Octafluoro-2-pentyne, are used. The process prevents etch stop.

IT 378-22-3
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(plasma etching process showing high etch

rate and selectivity to masks by using ethant gases
containing linear C5F8 in semiconductor device fabrication)

RN 378-22-3 HCAPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)

F 3 C—C≡C—C F 2 —C F 3

IC ICM H01L021-3065

CC 76-11 (Electric Phenomena)

ST fluoropentyne ethant plasma etching semiconductor device
fabrication; silica plasma etching fluoropentyne
ethant

IT Etching

(ethants; plasma etching process showing
high etch rate and selectivity to masks by using ethant
gases containing linear C5F8 in semiconductor device
fabrication)

IT Noble gases, processes

RL: PEP (Physical, engineering or chemical process); PYP (Physical
process); PROC (Process)

(ethant gases; plasma etching process showing
high etch rate and selectivity to masks by using ethant
gases containing linear C5F8 in semiconductor device
fabrication)

IT Semiconductor device fabrication

(plasma etching process showing high etch
rate and selectivity to masks by using ethant gases
containing linear C5F8 in semiconductor device fabrication)

IT Etching

(plasma; plasma etching process showing high
etch rate and selectivity to masks by using ethant
gases containing linear C5F8 in semiconductor device
fabrication)

IT 74-82-8, Methane, processes 75-10-5, Difluoromethane 75-46-7,
Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4,
Hexafluoroethane 76-19-7, Octafluoropropane 124-38-9, Carbon
dioxide, processes 353-50-4, Carbonyl fluoride 593-53-3,
Fluoromethane 630-08-0, Carbon monoxide, processes 2551-62-4,
Sulfur hexafluoride 7664-41-7, Ammonia, processes 7727-37-9,
Nitrogen, processes 7782-41-4, Fluorine, processes 7782-44-7,
Oxygen, processes 7783-54-2, Nitrogen trifluoride 7783-61-1,
Silicon tetrafluoride 10024-97-2, Nitrogen oxide (N2O), processes
10028-15-6, Ozone, processes 10102-03-1, Nitrogen oxide (N2O5)
10102-43-9, Nitrogen oxide (NO), processes 10102-44-0, Nitrogen
oxide (NO2), processes 10544-73-7, Nitrogen oxide (N2O3)
RL: PEP (Physical, engineering or chemical process); PYP (Physical
process); PROC (Process)

(ethant gases; plasma etching process showing
high etch rate and selectivity to masks by using ethant
gases containing linear C5F8 in semiconductor device
fabrication)

IT 378-22-3

RL: PEP (Physical, engineering or chemical process); PYP (Physical
process); PROC (Process)

(plasma etching process showing high etch
rate and selectivity to masks by using ethant gases
containing linear C5F8 in semiconductor device fabrication)

IT 7631-86-9, Silica, processes
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
 (substrate, etched; plasma etching process
 showing high etch rate and selectivity to masks by
 using ethant gases containing linear C5F8 in semiconductor
 device fabrication)

L19 ANSWER 5 OF 8 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:778120 HCPLUS Full-text
 DOCUMENT NUMBER: 139:269359
 TITLE: Method of plasma etching
 INVENTOR(S): Yamaguchi, Tomoyo; Fujimoto, Kiwamu; Kitamura, Akinori; Jy, Jeong; Fuse, Takashi; Obi, Machiko; Wada, Nobuhiro
 PATENT ASSIGNEE(S): Tokyo Electron Limited, Japan
 SOURCE: PCT Int. Appl., 19 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|------------------|-------------------|
| ----- | ---- | ----- | ----- | ----- |
| WO 2003081656 | A1 | 20031002 | WO 2003-JP2750 | 200303 07 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| JP 2003282540 | A | 20031003 | JP 2002-82717 | 200203 25 |
| AU 2003211846 | A1 | 20031008 | AU 2003-211846 | 200303 07 |
| TW 285925 | B | 20070821 | TW 2003-92106060 | 200303 19 |
| US 20050101140 | A1 | 20050512 | US 2004-949366 | 200409 27 |
| PRIORITY APPLN. INFO.: | | | JP 2002-82717 | A 200203 25 |
| | | | WO 2003-JP2750 | W 200303 07 |

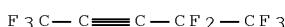
AB A method of plasma etching is described, which comprises introducing a gas containing 1,1,1,4,4,5,5,5-octafluoro-2-pentyne into a treatment chamber, and forming a plasma of the gas to thereby subject a SiO₂ coating film in an article to be treated being present in the treatment chamber to plasma etching through a pattern having openings of a photoresist mask placed on the coating film. The method can be used for carrying out plasma etching with high selection ratio of the coating film to the photoresist and/or with the suppression of etching-stop phenomenon.

IT 378-22-3

RL: NUU (Other use, unclassified); USES (Uses)
(C5F8, plasma etching gas; method of plasma
etching of silica using 1,1,1,4,4,5,5,5-octafluoro-2-
pentyne)

RN 378-22-3 HCAPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)



IC ICM H01L021-3065

CC 76-11 (Electric Phenomena)

ST plasma etching silica perfluoro pentyne

IT Etching

(plasma; method of plasma etching of silica using
1,1,1,4,4,5,5,5-octafluoro-2-pentyne)

IT Etching

(selective; method of plasma etching of silica using
1,1,1,4,4,5,5,5-octafluoro-2-pentyne)

IT 378-22-3

RL: NUU (Other use, unclassified); USES (Uses)
(C5F8, plasma etching gas; method of plasma
etching of silica using 1,1,1,4,4,5,5,5-octafluoro-2-
pentyne)

IT 7631-86-9, Silica, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PROC (Process)
(method of plasma etching of silica using
1,1,1,4,4,5,5,5-octafluoro-2-pentyne)

IT 7440-37-1, Argon, uses 7782-44-7, Oxygen, uses

RL: NUU (Other use, unclassified); USES (Uses)
(method of plasma etching of silica using
1,1,1,4,4,5,5,5-octafluoro-2-pentyne)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L19 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:377195 HCAPLUS Full-text

DOCUMENT NUMBER: 138:361441

TITLE: Gases for plasma reactions and process
for producing and using gases thereof

INVENTOR(S): Sugawara, Mitsuru; Yamada, Toshiro; Sugimoto,
Tatsuya; Tanaka, Kimiaki

PATENT ASSIGNEE(S): Zeon Corporation, Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|-------|----------|-----------------|--------------------|
| ----- | ----- | ----- | ----- | ----- |
| WO 2003041148 | A1 | 20030515 | WO 2002-JP11360 | 200210 31 |
| W: CN, KR, RU, US RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR | | | | |
| JP 2003146917 | A | 20030521 | JP 2001-342791 | 200111 08 |
| JP 4081647 | B2 | 20080430 | | |
| JP 2003282538 | A | 20031003 | JP 2002-81893 | 200203 22 |
| JP 3960095 | B2 | 20070815 | | |
| EP 1453082 | A1 | 20040901 | EP 2002-775447 | 200210 31 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK | | | | |
| CN 1613143 | A | 20050504 | CN 2002-826800 | 200210 31 |
| RU 2310948 | C2 | 20071120 | RU 2004-117212 | 200210 31 |
| KR 810954 | B1 | 20080310 | KR 2004-706815 | 200405 04 |
| US 20050092240 | A1 | 20050505 | US 2004-493225 | 200411 15 |
| US 7341764 | B2 | 20080311 | | |
| US 20080139855 | A1 | 20080612 | US 2008-7522 | 200801 11 |
| PRIORITY APPLN. INFO.: | | | JP 2001-342791 | A 200111 08 |
| | | | JP 2002-81893 | A 200203 22 |
| | | | WO 2002-JP11360 | W 200210 31 |
| | | | US 2004-493225 | A3 200411 15 |

OTHER SOURCE(S): MARPAT 138:361441

AB A gas for plasma reaction comprises a C5-6 perfluoroalkyne, preferably perfluoro-2-pentyne. This gas is suitable for use in the formation of a fine

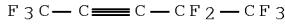
pattern by dry etching, thin-film CVD, or ashing. It is synthesized by contacting a dihydrofluoroalkane compound or monohydrofluoroalkene compound with a basic compound

IT 378-22-3P

RL: PNU (Preparation, unclassified); PRP (Properties); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(C5F8 plasma reaction gas; gas for plasma reaction, process for producing the same, and use)

RN 378-22-3 HCAPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)



IC ICM H01L021-3065

CC 76-11 (Electric Phenomena)

ST perfluoroalkyne plasma reaction gas etching CVD
ashing; perfluoropentyne plasma reaction gas
etching CVD ashing

IT Sputtering

(etching, reactive, for fine patterning, reactive
gases; gas for plasma reaction, process for
producing the same, and use)

IT Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(fluoro, monohydro-, reaction with base compds.; gas
for plasma reaction, process for producing the same, and use)

IT Alkanes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(fluoro, reaction with base compds.; gas for plasma
reaction, process for producing the same, and use)

IT Alkynes

RL: PNU (Preparation, unclassified); PRP (Properties); RCT
(Reactant); PREP (Preparation); RACT (Reactant or reagent)
(halo, perfluoroalkynes, plasma gas reactants;
gas for plasma reaction, process for producing the same,
and use)

IT Reaction

(plasma, reactant gases for; gas for plasma
reaction, process for producing the same, and use)

IT Ashing

Ion sources

Vapor deposition process

(plasma; gas for plasma reaction, process for producing
the same, and use)

IT Etching

(sputter, reactive, for fine patterning, reactive gases
; gas for plasma reaction, process for producing the
same, and use)

IT 378-22-3P

RL: PNU (Preparation, unclassified); PRP (Properties); RCT
(Reactant); PREP (Preparation); RACT (Reactant or reagent)
(C5F8 plasma reaction gas; gas for plasma
reaction, process for producing the same, and use)

IT 138495-42-8, 1,1,1,2,3,4,4,5,5,5-Decafluoropentane

RL: RCT (Reactant); RACT (Reactant or reagent)
(gas for plasma reaction, process for producing the
same, and use)

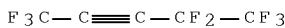
IT 7631-86-9, Silica, processes
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
 (plasma etching/CVD of; gas for plasma reaction, process for producing the same, and use)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 7 OF 8 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:368797 HCPLUS Full-text
 DOCUMENT NUMBER: 136:378597
 TITLE: Dry etching gas and process for dry etching
 INVENTOR(S): Nakamura, Shingo; Itano, Mitsushi
 PATENT ASSIGNEE(S): Daikin Industries, Ltd., Japan
 SOURCE: PCT Int. Appl., 22 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----------------------------|------|----------|------------------|-------------------|
| ----- | ---- | ----- | ----- | ----- |
| WO 2002039494 | A1 | 20020516 | WO 2001-JP9769 | 200111 08 |
| W: JP, KR, US TW 290741 | B | 20071201 | TW 2001-90127786 | 200111 08 |
| US 20040035825 | A1 | 20040226 | US 2003-415647 | 200305 06 |
| PRIORITY APPLN. INFO.: | | | JP 2000-341110 | A 200011 08 |
| | | | WO 2001-JP9769 | W 200111 08 |

AB A dry etching gas for fabrication of fine circuit boards comprises a compound having a CF₃C≡C— moiety. The etchant gas is environmentally acceptable and suitable for precision fabrication of fine circuit boards.
 IT 378-22-3
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (etchant; dry etching gas and process for dry etching)
 RN 378-22-3 HCPLUS
 CN 2-Pentyne, 1,1,1,4,4,5,5-octafluoro- (CA INDEX NAME)



ICS H01L021-768; C23F004-00
 CC 76-11 (Electric Phenomena)
 ST trifluoromethyl ethynyl etchant dry etching
 circuit board fabrication
 IT Etching
 (dry; dry etching gas and process for dry
 etching)
 IT Printed circuit boards
 (fabrication of, etchant gas for; dry
 etching gas and process for dry etching
)
 IT Ethynylation
 (trifluoromethyl ethynyl group containing compds.; dry
 etching gas and process for dry etching
)
 IT 116-14-3, uses 116-15-4 360-89-4
 RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant
 or reagent); USES (Uses)
 (etchant additive; dry etching gas
 and process for dry etching)
 IT 378-22-3 692-50-2 20174-11-2
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (etchant; dry etching gas and
 process for dry etching)
 IT 7440-21-3, Silicon, properties
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PRP (Properties); PROC (Process); USES (Uses)
 (substrate, etching of; dry etching
 gas and process for dry etching)
 REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L19 ANSWER 8 OF 8 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:185482 HCPLUS Full-text
 DOCUMENT NUMBER: 136:255880
 TITLE: Dry etching gas and method
 for dry etching
 INVENTOR(S): Hirose, Masataka; Nakamura, Shingo; Itano,
 Mitsushi; Aoyama, Hirokazu
 PATENT ASSIGNEE(S): Daikin Industries, Ltd., Japan
 SOURCE: PCT Int. Appl., 18 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----------------|------|----------|------------------|--------------|
| ----- | ---- | ----- | ----- | |
| ----- | | | | |
| WO 2002021586 | A1 | 20020314 | WO 2001-JP7678 | 200109 05 |
| W: JP, KR, US | | | | |
| TW 507289 | B | 20021021 | TW 2001-90122127 | 200109 06 |
| US 20040011763 | A1 | 20040122 | US 2003-362973 | 200303 |

August 4, 2008

10/520,272

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| | | | |
|------------------------|----------------|---|--------|
| PRIORITY APPLN. INFO.: | JP 2000-271709 | A | 06 |
| | | | 200009 |
| | | | 07 |
| | WO 2001-JP7678 | W | |
| | | | 200109 |
| | | | 05 |

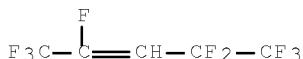
AB A dry etching gas which comprises a compound having a CF₃CF fragment directly bonded with a double bond (provided that the compound is exclusive of CF₃CF=CF₂=CF₂). Said dry etching gas permits the formation of a pattern such as a contact hole which has a high aspect ratio.

IT 86154-61-2

RL: NUU (Other use, unclassified); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(etchant; dry etching gas and method for dry etching)

RN 86154-61-2 HCPLUS

CN 2-Pentene, 1,1,1,2,4,4,5,5,5-nonafluoro- (CA INDEX NAME)



IC ICM H01L021-3065

CC 76-11 (Electric Phenomena)

ST fluorocarbon fluoroalkene etchant dry etching

IT Alkenes, properties

Hydrocarbons, properties

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(fluoro, etchants; dry etching gas and method for dry etching)

IT 116-15-4 360-89-4 754-12-1 760-42-9 2070-70-4 2252-83-7

70002-97-0 72804-49-0 86154-61-2 403855-46-9

403855-47-0 403855-48-1 403855-49-2 403855-50-5 403855-51-6

RL: NUU (Other use, unclassified); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(etchant; dry etching gas and method for dry etching)

IT 7631-86-9, Silica, properties

RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(etching of, etchants for; dry etching gas and method for dry etching)

REFERENCE COUNT:

7

THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L20 ANSWER 1 OF 3 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:673125 HCPLUS Full-text

DOCUMENT NUMBER: 149:22811

TITLE: Fluorocarbon film forming method by plasma sputtering, film forming apparatus, storage

INVENTOR(S): medium and semiconductor device
 Horigome, Masahiro
 PATENT ASSIGNEE(S): Tokyo Electron Limited, Japan
 SOURCE: PCT Int. Appl., 42pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|--|---------------|-----------------|----------------|
| ----- | ----- | ----- | ----- | ----- |
| WO 2008066172 | A1 | 20080605 | WO 2007-JP73227 | 200711 30 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW | RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | JP 2008140998 | A 20080619 | JP 2006-326041 |
| | | | | 200612 01 |
| PRIORITY APPLN. INFO.: | | | JP 2006-326041 | A |
| | | | | 200612 01 |

AB A film forming method is provided with a step of placing a substrate on a placing section in a processing chamber; a step of supplying inside the processing chamber with a gas to be excited by microwaves for generating plasma; a step of vacuum-exhausting inside the processing chamber; and a step of supplying inside the processing chamber with C5F8 gas. The gas inside the processing chamber is brought into the plasma state by supplying inside the processing chamber with microwaves from a planar antenna member, which is arranged on an upper part of the processing chamber to face the placing section and has many slits along the circumference direction, and a fluorine-added carbon film is formed on the substrate with the gas brought into the plasma state. High frequency power is applied to the placing section while forming the fluorine-added carbon film on the substrate so that a biasing high frequency power of 0.32W/cm² or less is applied on the substrate per unit area.

IT 378-22-3

RL: RCT (Reactant); RGT (Reagent); RACT (Reactant or reagent)
 (gas used in fluorocarbon film forming method by plasma sputtering)

RN 378-22-3 HCPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)

CC 76-3 (Electric Phenomena)
 IT 378-22-3 559-40-0, 1,2,3,3,4,4,5,5-Octafluoro-1-
 cyclopentene 3109-88-4
 RL: RCT (Reactant); RGT (Reagent); RACT (Reactant or reagent)
 (gas used in fluorocarbon film forming method by plasma
 sputtering)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L20 ANSWER 2 OF 3 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005:1282053 HCPLUS Full-text
 DOCUMENT NUMBER: 144:29498
 TITLE: Gas-barrier multilayer films with good adhesion
 to inorganic films and electroluminescent
 devices therewith
 INVENTOR(S): Fujii, Yoshinori
 PATENT ASSIGNEE(S): Nippon Zeon Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|-------|----------|-----------------|--------|
| ----- | ---- | ----- | ----- | ----- |
| ----- | ----- | ----- | ----- | ----- |
| JP 2005335067 | A | 20051208 | JP 2004-152761 | 200405 |
| | | | | 24 |
| PRIORITY APPLN. INFO.: | | | JP 2004-152761 | 200405 |
| | | | | 24 |

AB The films consist of transparent resin substrates and multilayer gas-barrier
 films having organic films and metal (compound) films, where the substrate
 surface have F atoms and the organic films are formed from F compds. and
 optionally (semi)metals or their compds. The organic films, preferably
 deposited by CVD, may show water absorption $\leq 0.1\%$. Electroluminescent devices
 having the films as gas-barrier films on top electrode layers or employing the
 same as flexible backplanes, are further claimed.
 IT 378-22-3, Octafluoro-2-pentyne
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); TEM (Technical or engineered material use); PROC
 (Process); USES (Uses)
 (CVD source; gas-barrier films having
 surface-fluorinated substrates and (semi)metal-containing organic films
 for LED)
 RN 378-22-3 HCPLUS
 CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)

F₃C—C≡C—CF₂—CF₃

ICS B32B009-00; H05B033-02; H05B033-04; H05B033-14
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 38
 IT 78-10-4, Tetraethoxysilane 378-22-3, Octafluoro-2-pentyne
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (CVD source; gas-barrier films having surface-fluorinated substrates and (semi)metal-containing organic films for LED)

L20 ANSWER 3 OF 3 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005:161116 HCPLUS Full-text
 DOCUMENT NUMBER: 142:231249
 TITLE: Semiconductor device, method for manufacturing semiconductor device, and gas for plasma CVD
 INVENTOR(S): Ohmi, Tadahiro; Kobayashi, Yasuo; Kawamura, Kohei; Teramoto, Akinobu; Sugimoto, Tatsuya; Yamada, Toshiro; Tanaka, Kimiaki
 PATENT ASSIGNEE(S): Tokyo Electron Limited, Japan; Zeon Corporation
 SOURCE: PCT Int. Appl., 36 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE | | |
|---|--|------------|-----------------|------------------|----------------|--------------|
| ----- | ---- | ----- | ----- | ----- | | |
| ----- | ----- | ----- | ----- | ----- | | |
| WO 2005017991 | A1 | 20050224 | WO 2004-JP11595 | 200408 12 | | |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | EP 1655772 | A1 | 20060510 | EP 2004-771570 | 200408 12 |
| R: DE, FR, GB, IT, NL | CN 1868044 | A | 20061122 | CN 2004-80030545 | 200408 12 | |
| KR 762031 | B1 | 20070928 | KR 2006-703117 | 200602 14 | | |
| US 20060264059 | A1 | 20061123 | US 2006-568461 | 200602 15 | | |
| PRIORITY APPLN. INFO.: | | | JP 2003-293739 | A | | |

200308
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JP 2003-293862 A 200308
15

JP 2003-311555 A 200309
03

WO 2004-JP11595 W 200408
12

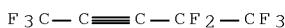
AB A semiconductor device having an insulating film comprising a F-doped C film having experienced a thermal history under a temperature of 420° or less is described, which is characterized in that the F-doped C film has a H atom content of 3 atomic% or less before the experience of the thermal history.

IT 378-22-3, Octafluoro-2-pentyne

RL: NUU (Other use, unclassified); USES (Uses)
(semiconductor device, method for manufacturing semiconductor device,
and source gas for plasma CVD)

RN 378-22-3 HCPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)



IC ICM H01L021-314

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 75

IT 378-22-3, Octafluoro-2-pentyne 559-40-0,

Octafluorocyclopentene 685-63-2, Hexafluoro-1,3-butadiene

RL: NUU (Other use, unclassified); USES (Uses)
(semiconductor device, method for manufacturing semiconductor device,
and source gas for plasma CVD)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

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L21 ANSWER 1 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:443578 HCPLUS Full-text

DOCUMENT NUMBER: 144:459337

TITLE: Plasma processing method

INVENTOR(S): Honda, Masanobu

PATENT ASSIGNEE(S): Tokyo Electron Limited, Japan

SOURCE: U.S. Pat. Appl. Publ., 18 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.

KIND DATE

APPLICATION NO.

DATE

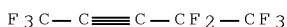
August 4, 2008

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| | | | | |
|------------------------|-------|----------|------------------|-------------------|
| ----- | ----- | ----- | ----- | ----- |
| US 20060096952 | A1 | 20060511 | US 2005-266232 | 200511 04 |
| JP 2006156992 | A | 20060615 | JP 2005-319316 | 200511 02 |
| CN 1790613 | A | 20060621 | CN 2005-10117383 | 200511 03 |
| PRIORITY APPLN. INFO.: | | | JP 2004-321872 | A 200411 05 |
| | | | US 2004-635620P | P 200412 14 |

AB Disclosed is a plasma processing method for processing a target object by using a plasma of a process gas containing a fluorocarbon compound. Used is a fluorocarbon compound having at least one triple bond within the mol. and at least one CF₃ group bonded by a single bond to the carbon atom forming the triple bond with the adjacent carbon atom such as 1,1,1,4,4,4-hexafluoro-2-butyne or 1,1,1,4,4,5,5,5-octafluoro-2-pentyne.
IT 378-22-3, 1,1,1,4,4,5,5,5-Octafluoro-2-pentyne
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(etchant; plasma processing method for etching layer in semiconductor fabrication using fluorocarbons)
RN 378-22-3 HCPLUS
CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)



INCL 216067000; 216041000; 216079000; 700266000
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 56
ST plasma processing fluorocarbon etching
IT Semiconductor device fabrication
(plasma processing method for etching layer in semiconductor fabrication using fluorocarbons)
IT Etching
(plasma; plasma processing method for etching layer in semiconductor fabrication using fluorocarbons)
IT 378-22-3, 1,1,1,4,4,5,5,5-Octafluoro-2-pentyne 692-50-2,
1,1,1,4,4,4-Hexafluoro-2-butyne
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(etchant; plasma processing method for etching layer in semiconductor fabrication using fluorocarbons)
IT 7631-86-9, Silica, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(etching of surface oxide; plasma processing method for

etching layer in semiconductor fabrication using
fluorocarbons)

L21 ANSWER 2 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005:426092 HCPLUS Full-text
 DOCUMENT NUMBER: 142:491907
 TITLE: Plasma processing method with organic resist on
substrate surface
 INVENTOR(S): Yamaguchi, Tomoyo; Fuse, Takashi; Fujimoto,
Kiwamu; Honda, Masanobu; Nagaseki, Kazuya; Koh,
Akiteru; Enomoto, Takashi; Ito, Hiroharu;
Kitamura, Akinori
 PATENT ASSIGNEE(S): Tokyo Electron Limited, Japan
 SOURCE: U.S. Pat. Appl. Publ., 45 pp., Cont.-in-part of
U.S. Ser. No. 607,537, abandoned.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|------------------|-------------------|
| US 20050103748 | A1 | 20050519 | US 2004-959152 | 200410 07 |
| CN 101093796 | A | 20071226 | CN 2007-10140293 | 200306 24 |
| CN 101154569 | A | 20080402 | CN 2007-10140294 | 200306 24 |
| PRIORITY APPLN. INFO.: | | | JP 2002-187422 | A 200206 27 |
| | | | JP 2002-214628 | A 200207 24 |
| | | | JP 2002-271588 | A 200209 18 |
| | | | JP 2002-271589 | A 200209 18 |
| | | | US 2002-420788P | P 200210 24 |
| | | | US 2002-423566P | P 200211 05 |
| | | | JP 2003-3540 | A 200301 09 |

| | | |
|----------------|----|--------|
| JP 2003-110225 | A | 200304 |
| | | 15 |
| JP 2003-151416 | A | 200305 |
| | | 28 |
| US 2003-607537 | B2 | 200306 |
| | | 27 |
| CN 2003-815028 | A3 | 200306 |
| | | 24 |

AB An object of the present invention is to provide a plasma processing method, which can improve the etching resistance of an organic layer, such as an ArF photoresist layer, without incurring a decrease in yield, a decrease in throughput, or an increase in cost. A plasma processing method includes a step of preparing a process subject having an organic layer on a surface thereof, and a step of irradiating the process subject with H₂ plasma to improve plasma resistance of the organic layer.

IT 378-22-3, 1,1,1,4,4,5,5,5-Octafluoro-2-pentyne
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (hydrogen plasma processing method with organic resist on substrate surface)

RN 378-22-3 HCPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)

F₃C—C≡C—CF₂—CF₃

IC ICM C23F001-00
 INCL 216067000
 CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 74
 IT Etching
 (plasma; hydrogen plasma processing method with organic resist on substrate surface)
 IT 75-10-5, Difluoromethane 378-22-3, 1,1,1,4,4,5,5,5-Octafluoro-2-pentyne 409-21-2, Silicon carbide (SiC), processes 593-53-3, Methyl fluoride 7440-21-3, Silicon, processes 7631-86-9, Silica, processes
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (hydrogen plasma processing method with organic resist on substrate surface)

L21 ANSWER 3 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:533909 HCPLUS Full-text
 DOCUMENT NUMBER: 141:97889
 TITLE: Method for fabricating semiconductor device
 INVENTOR(S): Lee, Sung-kwon; Kim, Sang-ik; Sun, Jun-hyeub

August 4, 2008

10/520,272

23

PATENT ASSIGNEE(S): Hynix Semiconductor Inc., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 10 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------------|
| US 20040127052 | A1 | 20040701 | US 2003-617226 | 200307 11 |
| US 7052999 | B2 | 20060530 | | 200212 |
| KR 2004057485 | A | 20040702 | KR 2002-84234 | 26 |
| PRIORITY APPLN. INFO.: | | | KR 2002-84234 | A 200212 26 |

AB A method for fabricating a semiconductor device capable of decreasing a parasitic capacitance to thereby increase a cell capacitance. To achieve this effect, the deposited 3rd inter-layer insulation layer is planarized and is subjected to a wet etching process to make its height lower than that of the bit line. Afterwards, the nitride-based etch stop layer is formed on the etched 3rd inter-layer insulation layer, and then, the contact hole for forming the storage node contact plug is formed in between the bit lines through the SAC process so that the etch stop layer does not remain at sidewalls of the bit line. From this structure, it is possible to decrease the parasitic capacitance, and this decrease further provides an effect of increasing the cell capacitance.

IT 378-22-3

RL: NUU (Other use, unclassified); USES (Uses)
(method for fabricating semiconductor device)

RN 378-22-3 HCPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5-octafluoro- (CA INDEX NAME)

F 3 C—C≡C—CF 2—CF 3

IC ICM H01L021-311

INCL 438700000

CC 76-3 (Electric Phenomena)

IT 75-10-5, Difluoromethane 75-46-7, Trifluoromethane 76-19-7,
Perfluoropropane 116-14-3, Perfluoroethene, uses 354-33-6,
Pentafluoroethane 378-22-3 593-53-3, Monofluoromethane
685-63-2, Hexafluoro-1,3-butadiene 7440-37-1, Argon, uses
7782-44-7, Oxygen, uses 11070-66-9, Perfluorobutene 268566-74-1
RL: NUU (Other use, unclassified); USES (Uses)
(method for fabricating semiconductor device)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L21 ANSWER 4 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2004:21030 HCPLUS Full-text

August 4, 2008

10/520,272

24

DOCUMENT NUMBER: 140:86074
 TITLE: Plasma processing method
 INVENTOR(S): Yamaguchi, Tomoyo; Fuse, Takashi; Fujimoto, Kiwamu; Honda, Masanobu; Nagaseki, Kazuya; Koh, Akiteru; Enomoto, Takashi; Ito, Hiroharu; Kitamura, Akinori
 PATENT ASSIGNEE(S): Tokyo Electron, Limited, Japan
 SOURCE: PCT Int. Appl., 115 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|--|----------------|------------------|--------------|
| ----- | ----- | ----- | ----- | ----- |
| WO 2004003988 | A1 | 20040108 | WO 2003-JP7960 | 200306 24 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | AU 2003244166 | AU 2003-244166 | 200306 24 |
| AU 2003244166 | A1 | 20040119 | AU 2003-244166 | 200306 24 |
| CN 1663030 | A | 20050831 | CN 2003-815028 | 200306 24 |
| CN 101093796 | A | 20071226 | CN 2007-10140293 | 200306 24 |
| CN 101154569 | A | 20080402 | CN 2007-10140294 | 200306 24 |
| PRIORITY APPLN. INFO.: | | JP 2002-187422 | A | 200206 27 |
| | | JP 2002-214628 | A | 200207 24 |
| | | JP 2002-271588 | A | 200209 18 |
| | | JP 2002-271589 | A | 200209 18 |

| | | |
|-----------------|----|--------------|
| US 2002-420788P | P | 200210 24 |
| US 2002-423566P | P | 200211 05 |
| JP 2003-3540 | A | 200301 09 |
| JP 2003-110225 | A | 200304 15 |
| JP 2003-151416 | A | 200305 28 |
| CN 2003-815028 | A3 | 200306 24 |
| WO 2003-JP7960 | W | 200306 24 |

AB A plasma processing method is described, which comprises the step of providing an element to be processed having an organic layer on the surface thereof, and the step of applying H₂ plasma to the element to be processed to improve the plasma-resistance of the organic layer.

IT 378-22-3

RL: NUU (Other use, unclassified); USES (Uses)
(C5F8; plasma processing method by hydrogen plasma)

RN 378-22-3 HCPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)

F₃C—C≡C—CF₂—CF₃

IC ICM H01L021-3065

CC 76-11 (Electric Phenomena)

IT Etching

(plasma; plasma processing method by hydrogen plasma)

IT 378-22-3

RL: NUU (Other use, unclassified); USES (Uses)
(C5F8; plasma processing method by hydrogen plasma)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L21 ANSWER 5 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:505376 HCPLUS Full-text

DOCUMENT NUMBER: 137:71463

TITLE: Method of forming integrated circuitry and
method of forming shallow trench isolation in a
semiconductor substrate

August 4, 2008

10/520,272

26

INVENTOR(S): Trapp, Shane J.
PATENT ASSIGNEE(S): Micron Technology, Inc., USA
SOURCE: U.S. Pat. Appl. Publ., 7 pp., Cont.-in-part of
U.S. Ser. No. 752,685.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|--------------------|
| US 20020086543 | A1 | 20020704 | US 2001-920978 | 200108 01 |
| US 6897120 | B2 | 20050524 | | |
| US 20020123226 | A1 | 20020905 | US 2001-752685 | 200101 03 |
| US 7202171 | B2 | 20070410 | | |
| PRIORITY APPLN. INFO.: | | | US 2001-752685 | A2 200101 03 |

AB A method of forming integrated circuitry includes forming a silicon nitride comprising layer over a semiconductor substrate. At least a portion of the silicon nitride comprising layer is etched using an etching chemical comprising ammonia and at least one fluorocarbon. A method of forming shallow trench isolation in a semiconductor substrate includes depositing a silicon nitride comprising layer over a bulk semiconductor substrate. A photoresist comprising masking layer is formed over the silicon nitride comprising layer. The photoresist comprising masking layer is patterned effective to form a plurality of shallow trench mask openings therethrough. The silicon nitride comprising layer is etched through the mask openings substantially selectively relative to the photoresist using an etching chemical comprising ammonia and at least one fluorocarbon.

IT 378-22-3

RL: RCT (Reactant); RACT (Reactant or reagent)
(method of forming integrated circuitry and method of forming
shallow trench isolation in a semiconductor substrate)

RN 378-22-3 HCAPLUS

CN 2-Pentyne, 1,1,1,4,4,5,5,5-octafluoro- (CA INDEX NAME)

F₃C—C≡C—CF₂—CF₃

IC ICM H01L021-461
ICS H01L021-76; H01L021-302
INCL 438706000
CC 76-3 (Electric Phenomena)
ST fluorocarbon etching shallow trench isolation
semiconductor substrate integrated circuit
IT Etching
Integrated circuits
Photoresists
Semiconductor device fabrication
Semiconductor devices

(method of forming integrated circuitry and method of forming shallow trench isolation in a semiconductor substrate)

IT 75-10-5, Difluoromethane 75-46-7, Trifluoromethane 75-73-0, Carbon fluoride (CF4) 76-16-4 76-19-7 115-25-3, Carbon fluoride (C4F8) 378-22-3 685-63-2 7664-41-7, Ammonia, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(method of forming integrated circuitry and method of forming shallow trench isolation in a semiconductor substrate)

REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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